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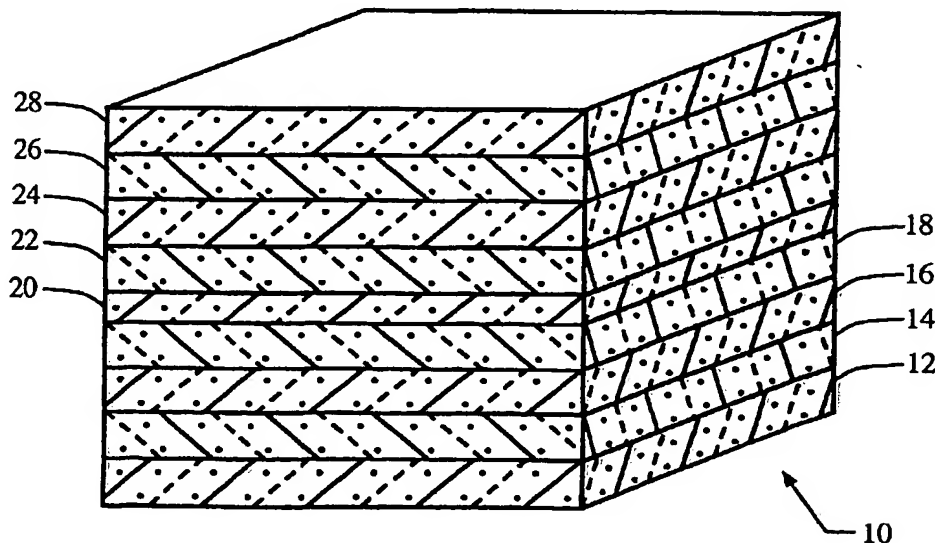
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(54) Title: CHARGE CONTROLLED AVALANCHE PHOTODIODE AND METHOD OF MAKING THE SAME



(57) **Abstract:** The present invention includes an epitaxial structure (16) grown on a semi-insulating InP substrate (12). First, a buffer layer (14) is grown to isolate defects originated from substrates (12). Then an n-type layer (18) is grown to serve as n-contact layer to collect electrons. Next, a multiplication layer (20) is grown to provide avalanche gain for the APD device (10). Following that, an ultra-thin charge control layer (22) is grown with carbon doping. An absorption layer (24) is grown to serve as the region for creating electronhole pairs due to a photo-excitation. Finally, a p-type layer (28) is grown to serve as p-contact layer to collect holes.

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